

Level 3 Biology BY323Y1

Achievement Standard assessment activity

Subject Reference : Biology 3.1

Internal assessment resource reference number: **Bio/3/1_C3**

Achievement Standard AS90713 Version 2

Carry out a practical investigation into an aspect of an organism's ecological niche with guidance

Credits: 4

Your task is to *gather and process information* on the ecological niche of your chosen plant or animal. This will provide information to help you develop an investigation into an interaction or relationship between your chosen organism and an aspect of its ecological niche.

This investigation is divided into three tasks.

- | | |
|---------------|--|
| Task 1 | Selecting an aspect of the ecological niche to investigate. |
| Task 2 | Carrying out the investigation. |
| Task 3 | Reporting. |

Conditions

- Expect to spend up to 20 hours on this research and report.
- The report must be your own work.
- You and your supervisor must sign the BY323Y1A, BY323Y1B and BY323Y1C Cover Sheets and send them in with your work as each Milestone is reached.
- Your report may be hand written or word processed (Arial font , size 12 print).

- You will be required to meet the following milestones:

Milestone contact	Aspect covered	Cover Sheet required	Signed
<i>Informal contact by phone or email for Milestone 1.</i>	(i) Focussing and Planning: <i>Investigate the ecological niche of your chosen organism and develop a hypothesis to investigate test. Record information in your logbook and “discuss” with your teacher.</i>		
<i>Send in evidence for Milestone 2.</i>	(ii) Focussing and Planning: <i>Submit your logbook with a summary of the ecological niche of your organism, your hypothesis, and your initial method to your teacher for checking.</i>	BY323Y1A	
<i>Send in evidence for Milestone 3.</i>	(i) Information gathering: <i>Evaluate the quality of the information recorded in your logbook (i.e. will it allow a trend or pattern to be identified?) and its relevance to your investigation.</i> (ii) Processing and Interpreting data <i>Discuss your analysis of results and conclusion with your teacher.</i>	BY323Y1B	
<i>Send in Final Report</i>	<i>Send in your logbook and finished report. (Overseas students are advised to email pages of your logbook and final report. Postal delays may make it difficult for you to complete this standard,)</i>	BY323Y1C	

- ANIMAL ETHICS:**
 - Experimental work on the following animals requires permission from an animal ethics committee: mammals, birds, reptiles, amphibians, fish, octopus, squid, crab, crayfish or lobster.
 - Slaters, insects, snails and other invertebrates do not require permission.
 - At no time should any organism be subjected to extremes of temperature, dehydration or other circumstances that cause them injury or pain.
- AUTHENTICITY:**

This will be established by:

 - Using digital photos to establish authenticity of method..
 - Having logbooks checked by the teacher to ensure milestones have been reached.
 - Submitting signed Cover Sheets, BY323Y1A, BY323Y1B and BY323Y1C

- LOGBOOK:

You are required to keep a logbook and hand it in with your final report:

- *All ideas, questions, rough notes, references, brainstorming, possible investigations, raw data and observations, research and planning, failures, successes, tentative conclusion go into the **logbook**.*
- *It is your 'rough' copy and a **working** document. Its neatness is not important - its function is to record all findings, show your skills in investigation and to record the milestones. It will be used to ensure authenticity and to support your final assessment for this achievement standard.*
- *All entries must be dated.*
- *You will use this logbook to help you write your formal report. (If you have access to a computer, you should start to develop your formal report in an electronic format as soon as possible)*
- *The logbook may be an exercise book, plastic folder or refill paper sheets, held together by staples, paper clip or split pin.*
- *Except for overseas students, the **whole logbook** must be sent in at each milestone and with the final report.*
- *Make sure both your name and ID number are clearly recorded on the front of your logbook.*

TASK 1 – INVESTIGATING THE ECOLOGICAL NICHE OF A NAMED ORGANISM

The ecological niche of an organism includes the *physical conditions* of the habitat (abiotic factors), the range of *other organisms present* (biotic factors) and how these link together to provide opportunities and threats for the organism. As well, the niche includes the **adaptations** that the organism has to allow it to exploit these opportunities and avoid the threats.

The purpose of this task is to provide information that will be used as a starting point for you to formulate an *explicit* and *testable* aim, or question / hypothesis and to develop an **investigation into an interaction or relationship** between the organism and either an abiotic or a biotic factor in its environment. This will therefore relate to a **relevant** aspect of the ecological niche of the slater.

Keep a record of the source of any written ideas and information. Use this information to develop a **reference list** that will be included in the final report.

(a) Feeding relationships:

Outline the feeding relationships that the organism is involved in eg. Herbivore, carnivore.

(b) Habitat

Examine the habitat of the organism using researched background information and your own observations and measurements. Consider biotic and abiotic factors such as:

- temperature
- light intensity
- humidity
- soil/substrate type
- density.
- other organisms present

(c) Adaptive Features

Examine the adaptive features of the organism using background information and your own observations and measurements. The adaptive features may be related to:

- movement
- excretion
- nutrition
- gas exchange
- growth
- competition
- sensitivity

NOTE: Information on the **ecological niche of the organism relevant to the aspect being investigated** will later be written up to form the **introduction** section of your report.

It will also be used to **discuss the aspect of the organism's ecological niche being investigated**.

TASK 2 – CARRYING OUT THE INVESTIGATION

This will form the main part of your report.

Focusing and Planning

Using observations and information you have gathered in Task 1, select aspects of the organism's niche for possible further investigation. The aspects of the ecological niche selected must be ones that are **significant** to the way of life of the organism and show an interaction or relationship between the organism and either an abiotic or a biotic factor. They must also provide you with the opportunity to develop and carry out an investigation that is appropriate to Year 13 Biology.

- a) In your logbook record aspects of the ecological niche/ interactions or relationships that could be investigated.
- b) Formulate possible hypotheses for investigations relating to these aspects.
- c) Record ideas of how you could investigate these hypotheses.

MILESTONE 1: Discuss your hypotheses and your ideas with your teacher.

- d) After discussion with your teacher, **choose one hypothesis** to investigate that *links to the aspect of the ecological niche of the organism you are investigating*.
- e) Use the information collected in Task 1 to write a brief **introduction** of the ecological niche of your organism focussing on the interaction or relationship you are investigating and why it is significant to the way of life of the organism. Include information relevant to the hypothesis you have chosen to investigate.
- f) **Initial method.** Develop a step by step method for an investigation that will lead to a valid conclusion. Check that the equipment you want to use is available. You should trial some aspects of your investigation to ensure your method will be workable.

MILESTONE 2: Submit your initial method and logbook to your teacher with Cover Sheet 323Y1A.

Information Gathering

- g) **Carry out your investigation.** Record all relevant raw data *accurately* and clearly in a way that allows it to be interpreted without reference to the method. Make sure you collect *sufficient data* or *samples* to enable a valid trend or pattern (or lack of) and to allow you to draw a valid conclusion,

MILESTONE 3: Evaluate the quality of the information gathered and its degree of relevance. Send in your raw data and processed data and draft analysis of results with signed Cover Sheet 323Y1B.

Discuss your findings with your teacher before writing up your final report.

Processing and Interpreting Data

- h) **Process** your data in a way that is *appropriate to the type of data* you have collected.
- i) **Analyse** your processed data to identify trends, relationships or patterns (or lack of) relevant to your hypothesis.
- j) Write a **conclusion** for your investigation. This must link to your data and to your hypothesis.
- k) You are expected to use appropriate statistical procedures to establish the *validity* of your conclusion.

TASK 3 – REPORTING

Using the information you have collated in your logbook, present your findings from Tasks 1 and 2 in a formal scientific report that includes the following sections:

- **Introduction** – a brief description of the ecological niche of your organism focussing on the **aspect** you investigated, explaining **why it is *significant to the way of life of the organism***. This was developed in Task 1 and 2 d above).
- **Purpose** – an explicit aim or hypothesis /testable question.
- **Final method** used.
- **Results** – processed data showing the presence (or absence) of a trend, relationship or pattern.
- **Conclusion** – analysis of processed data in terms of the purpose of the investigation.
- **Discussion**
 1. **Discuss** the biological significance of the results and how they relate to the ecological niche of the organism
 2. **Discuss** the validity of your investigation in terms of **either**: analysing the *reliability* of the data collected. You could consider such things as how sources of error were eliminated, how limitations were overcome and/or how the effects of bias were reduced **OR** use statistical analysis to establish validity of your conclusion drawn from the data.
- **Reference List** Record all sources of information used during this investigation.
- **Appendix** - recorded data and observations such as raw data from trials or pilot investigations if used.
- **Send in your logbook and final report with the signed Cover Sheet BY323Y1C**

Student Guidelines for Referencing

1. Authenticity of Ideas, Facts and Quotations:

To ensure all sources can be checked and authenticated, any quotations, ideas or facts from your reference sources must be acknowledged at the point where they are used in your report. This can be done in the form:

Author's surname, date of publication, page numbers, in brackets. e.g. (Smith, 1998, p293)

This appears in the text of your article immediately after the sentence in which the material has been used.

This may also be done in the form of footnotes. This involves the use of a number in the text next to your quoted material which refers to the author, data of publication and page numbers (or Internet site) listed at the bottom of the page.

e.g. "The Human Rights Society believes that an embryo is sacred and should never be killed¹"

2. Reference List

To ensure all facts/ideas/data/quotes/pictures/diagrams/maps, etc. that you used can be checked and authenticated; any references used as information sources for the final report must be acknowledged in a reference list. It is recommended that you use the American Psychological Association (APA) referencing system.

➤ For Books:

This is written in the form: author, date of publication, title, and publication information.

Author(s). Write the family name then initials for all authors. Use commas to separate authors. Finish with a full stop, e.g. Selinger, B.

Date of publication. Give the year the work was published in brackets, e.g. (1989).

Title. This is in italics with additional information in brackets to enable identification, e.g. *Chemistry in the Marketplace* (4th ed.).

Publication information. Give the name of the city, then a colon followed by the name of the publisher written as briefly as possible, e.g. leave out terms like publishers, Co. e.g. Sydney: Heinemann.

This goes together as follows:

Selinger, B. (1989). *Chemistry in the Marketplace* (4th ed.). Sydney: Heinemann.

➤ For Periodicals:

This is written in the form: author, date of publication, article title, journal title, and publication information.

Author(s) and date of publication. This is the same as for books, e.g. Becker, L.J. & Seligman, C. (1981).

Article title. This is in normal type, e.g. Welcome to the Energy Crisis.

Journal title and publication information. Give the journal title in full in italics. Next give the volume number but do not use "Vol." before the number. Finally give the page numbers. Use "pp" before the page numbers in newspapers and magazines but not in references to journal articles, e.g. *Journal of Social Issues*, 37, 1-7.

This goes together as follows:

Becker, L.J. & Seligman, C. (1981). Welcome to the Energy Crisis. *Journal of Social Issues*. 37, 1-7.

➤ For the Internet:

Where you use information from the Internet e.g. text, photographs, maps or anything else you should provide three pieces of information. These are:

1. the **web address**

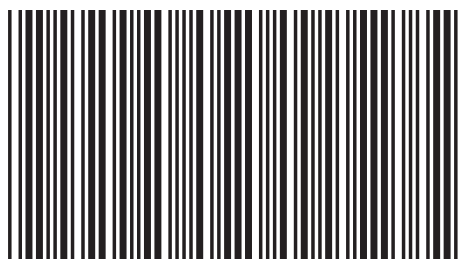
¹New Zealand Herald, Jan 10th, 2006

2. what organisation or **person is in charge** of the web site.

3. the **date** you accessed the web page. E.g.

www.usgs.com/catastrophism/asaro (United States Geological Society, accessed on 12.02.06)

COVER SHEET – BY323Y1C



STUDENTS – PLACE STUDENT ADDRESS LABEL BELOW OR WRITE IN YOUR DETAILS.

Full Name _____
ID No. _____
Address _____
(If changed)

AUTHENTICATION STATEMENT

I certify that the assessment work is the original work of the student named above.

Signed _____ Signed _____
(Student) (Supervisor)

FOR SCHOOL USE ONLY

ASSESSMENT

WWW.TEKURA.SCHOOL.NZ

COVER SHEET – BY323Y1B



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Full Name	_____
ID No.	_____
Address (If changed)	_____

AUTHENTICATION STATEMENT	
I certify that the assessment work is the original work of the student named above.	
Signed (Student)	Signed (Supervisor)

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ASSESSMENT

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COVER SHEET – BY323Y1A



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(Student) (Supervisor)

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